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REDUCTION OF THE REVIEW.

This volume of the MONTHLY WEATHER REVIEW opens on a reduced basis, averaging 60–65 numbered pages (instead of 75–80), 1–3 plates, and the regular number of lithographed charts. The curtailment, which began with the November issue, has been rendered necessary because of a number of factors: (1) Twenty per cent increase in the cost of publication; (2) increased amount of aerological data to be published; (3) large size of the MONTHLY WEATHER REVIEW in 1919, and (4) additional expense for larger edition and larger number of separates to meet the increased demand. The average space allotment per issue is planned as follows: Contributions (including illustrations in text), 23 pages; abstracts, reviews, notes, reprints, and bibliography, 20 pages; solar data, 1 page; weather of the month, 14 pages; and seismology, 4 pages. Since the cut falls almost exclusively on the space available for contributions, yet still leaves a good opportunity for publishing them, it is hoped that there will be but little loss in the usefulness of the REVIEW in spite of the reduced number of pages.—EDITOR.

AVERAGE FREE-AIR CONDITIONS AS OBSERVED BY MEANS OF KITES AT DREXEL AEROLOGICAL STATION, NEBR., DURING THE PERIOD NOVEMBER, 1915, TO DECEMBER, 1918, INCLUSIVE.

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[Weather Bureau, Washington, Feb. 27, 1920.]

SYNOPSIS.

During the period, November, 1915, to December, 1918, 1,579 free-air observations [1] were obtained by means of kites at Drexel, Nebr. These include a large number that were made as parts of series of successive flights whose purpose was the determination of the diurnal variation of different elements at various altitudes. In the present summary the extra observations have not been used; only one for each day, usually the highest during the daytime. In this way equal weight is given to each day in the computation of monthly, seasonal, and annual means. In all, 1,074 days are represented, failures on the remaining 83 days being due for the most part to light winds. In the consideration of free-air winds in relation to those at the surface all observations obtained in the daytime have been included.

A discussion of the reliability of the data indicates that instrumental and observational errors have been largely eliminated; that the monthly distribution is good; that the diurnal distribution is less satisfactory, but probably fairly representative, at any rate for all levels a short distance above the surface; but that, owing to the shortness of the period under consideration and its wide departures at times from normal conditions, some of the monthly means can not be considered as normal values. These irregularities largely disappear, however, in the seasonal and annual averages; and the latter, especially, may be accepted as closely approximating true conditions. In considering free-air winds it is necessary to bear in mind that the averages given do not include days with very light or very strong winds, since kites can not be flown under those conditions.

Tables and figures give mean monthly, seasonal, and annual values of the different elements at various levels up to 5 kilometers. The data are compared with similar data for Mount Weather, Blue Hill, and elsewhere, and a separate table contains comparative values of air density, as determined by different investigators for various parts of the world

INTRODUCTION.

The purpose of this summary is to present in brief and convenient form for the information and use of artillery and aviation services the results of free-air observations [1] that have been secured by means of kites at Drexel, Nebr. No attempt is made for the present to discuss these results further than to indicate their reliability as normal values and to give some comparative data for other places.

Number and distribution of observations.—During the period under consideration, viz, November, 1915, to December, 1918, inclusive, kite flights were made on 1,074 days. Failures on the remaining 83 days were due in most cases to lack of wind and were distributed quite evenly among the different months. In all, 1,579 observations were obtained; on some days a second flight was made when it was thought that a greater altitude could be reached than in the first one; but in most cases the extra observations were obtained in the course of diurnal series consisting of 8 flights on the average and covering periods of 24 to 36 hours. In the computation of mean monthly, seasonal and annual values presented in tables 4, 6, and 7 these extra observations have not been used, it being thought that undue weight might thus be given to certain days that were particularly favorable for kite flying. When more than one flight was made on a single day the highest as a rule has been used, except that, in the case of diurnal series, none of those made at night has been considered. The number of observations, monthly, seasonal and annual and at various altitudes, upon which are based the values given in Tables 4, 6, and 7 may be found in Table 1. The monthly distribution at all altitudes is fairly good, the larger number in November and December being due to the fact that those two months are represented by four years' observations, whereas the other months are represented by only three. More than half of the flights extend to an altitude of 3 kilometers above sea level, but the number

[1] By "observation" is meant a complete record of free-air conditions at various altitudes, as obtained in each kite flight. As a rule, such a record makes possible the computation of values at several different altitudes. These separate determinations might themselves be called observations, but are not so considered here.